

# Dietary Survey for Planning a Local Nutrition Program

LEONA R. SHAPIRO, M.S., RUTH L. HUENEMANN, D.Sc., and MARY C. HAMPTON, M.S.

**I**N 1958 and 1959 a dietary survey was made by the health department of Berkeley, Calif., an urban community of approximately 111,000 population. The data obtained were to be used in planning a nutrition program. The objectives of the nutrition program were (a) to demonstrate the effectiveness of a nutrition service in the total program of a health department which provides adequate supporting services, and (b) to provide a field training center in nutrition for graduate students from the School of Public Health located in Berkeley. The long-range goal of the program was the same as that of all nutrition programs, the improvement of the nutrition of residents of the community.

This paper describes the dietary survey and discusses its value in establishing a nutrition program.

## Sources of Nutrition Data

In building a new program suited to the needs of a particular community the nutritionist has various sources of information, but they are diffuse and nonspecific. For example, mor-

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*The authors are on the faculty in nutrition of the School of Public Health, University of California, Berkeley. Miss Shapiro is a lecturer, Dr. Huene-mann is associate professor of public health nutri-tion, and Mrs. Hampton is an associate on the faculty. Miss Shapiro is also nutritionist for the Berkeley Department of Public Health. Dr. Wil-liam Taylor, also of the University of California School of Public Health, was a consultant on the statistical aspects of the study.*

bidity and mortality statistics, the valued means of diagnosing the community's ill health, have only limited usefulness in identifying nutri-tional deficiencies in the United States. Also, a study of general economic conditions and observations of the food supply in the market-place tell us only what people can buy, not what they choose to buy.

An important source of information are the observations of the field staff of the local health department. Perhaps it is stressing the obvious to point out that a nutritionist can be added to the staff of a health department only if the professional staff recognizes a need for nutrition services. In routine contacts with families and individuals in homes, clinics, schools, and other community settings, a com-petent field staff can see any significant gap which may exist between current scientific knowledge about nutrition and day-by-day nutrition practices. Such observations, while of considerable value in pinpointing areas of need, have limitations in that they concern those segments of the population already re-ceiving health department services rather than the community as a whole. Also, a public health field staff does not focus on the details of nutrition in usual contacts with patients.

Nutrition program planning must be based on two equally important factors: the needs and the interests of the community. There-fore, initial study of the community must help not only to discover existing nutrition weak-nesses and strengths in the prevailing dietary habits but also to learn about interests, atti-tudes, and possible motivations in relation to food and eating practices among the various

groups that comprise the total community. The dietary survey has the potential for providing such information, which is otherwise not available.

### Survey Plan

The population of Berkeley includes university students and faculty members and persons employed in a broad range of businesses and industries. Economic levels vary widely. There are a variety of ethnic backgrounds, including Negro, Oriental, and Spanish-American. Such a diversified population precluded any attempt to get a cross-section sample. The alternative used was to study relatively homogeneous groups separately. It was decided to survey two areas, and random samples were drawn of dwellings in these areas, each area representing two adjacent census tracts.

Area A was selected on the basis of its heavy concentration of health department services, more inadequate housing and crowding, and higher rates than other areas of the city for infant deaths, tuberculosis, venereal disease, public assistance cases, adult and juvenile probation, and other stigmata of social breakdown (1). The selection of area B was made on the basis of the most recent census report (almost 10 years old) giving the median income for each of the city's census tracts. Area B's median income was approximately midway between that of area A and those areas having the highest median income.

The survey sample was drawn from the city assessor's street maps. Each dwelling within the specified area was given a consecutive number, and those dwellings whose numbers matched a previously selected list of random numbers were included in the sample. Table 1 indicates size of samples, number of successfully completed interviews, the number of unsuccessful contacts, and reasons for failure. Sixty-eight percent of group A households and 74 percent of group B households were eligible for interviewing. The three requirements for eligibility were: two or more residents in the household, a family unit, and at least two-thirds of the food consumed the previous day having come from a common food supply. Interviewers had no way of knowing before ring-

**Table 1. Households in survey sample, according to eligibility for interview, by group**

Eligibility for interview	Group A (192 households)		Group B (188 households)	
	Number	Per cent	Number	Per cent
Eligible.....	131	100	140	100
Interview completed <sup>1</sup> ..	108	82	101	72
Refused to cooperate..	18	14	33	24
Gave insufficient information <sup>2</sup> .....	5	4	6	4
Not eligible.....	61	100	48	100
By definition.....	48	79	40	83
Not at home <sup>3</sup> .....	11	18	6	13
Dwelling unoccupied..	2	3	2	4

<sup>1</sup> Includes some households from which incomplete information about income or expenditure for food, or both, was obtained.

<sup>2</sup> Language problem, insufficient information, or information seemed unreliable.

<sup>3</sup> After at least 4 calls.

ing the doorbell if the residents would meet these eligibility criteria. Ineligibility accounted for the largest number of unsuccessful contacts.

### Interviewing

Area A was surveyed in 1958 and area B in 1959, each in the 4-week period immediately preceding Thanksgiving. All interviewing was carried out in the respondents' homes using a pretested schedule of open-ended questions. The questions were designed to gather data about family shopping and eating practices, cost of the family's food, factors that influence food selection, prevalence of modified diets, use of supplements, what the homemaker considers to be problems in feeding her family, and where she turns for nutrition information.

The major portion of the interview was devoted to obtaining information about the kinds and amounts of food and drink all members of the household had consumed the previous day (2). The homemaker who had shopped and prepared the meals and put away the leftovers was able to provide most of this information, often showing the interviewer the size of package, bowl, or saucepan used for preparing and serving meals to help estimate quantities. Return visits to the homes and followup telephone

calls were necessary in many instances to get details from various family members of meals eaten in restaurants and school cafeterias, coffeebreak items, and after-school snacks eaten away from home. Recipes were provided in some cases by the homemaker or by the school lunch director.

Questions about age of adults and family income were asked by presenting to the interviewees a card with age and income ranges and asking that the appropriate ones be chosen. In group A so many preferred to ignore the card and state specific age and income that the interviewers stopped using the card and simply asked about age and income, apparently without creating any ill will. For group B the cards were used throughout.

Homemakers were not notified in advance that they were to be interviewed. In general, the reception given the interviewers was good; the number of refusals was relatively small. In group A, 9 percent of the total sample refused to be interviewed; in group B the proportion of refusals was almost twice as great. Similarly there was less reluctance in group A to give income data, with only 8 percent refusals in contrast to 20 percent in group B. Seven percent of group A and 9 percent of group B households did not answer the question about expenditure for food.

A major time-consuming element was the need for repeated return visits (table 2). It appears that city dwellers, even homemakers without outside employment, do not stay home very much. Interviewing was done by nutritionists, by public health nurses given special training in dietary interviewing, and by grad-

**Table 2. Activities required to obtain interviews, by group**

Activity	Group A (192 households)	Group B (188 households)
Visit .....	482	356
Day .....	428	324
Evening .....	54	32
Telephone calls <sup>1</sup> .....	57	115
Visits per successful interview ..	4.5	3.6
Visits and telephone calls per successful interview .....	5.0	4.7

<sup>1</sup> To gather supplemental data.

**Table 3. Distribution of survey groups by makeup of household, ethnic group, and educational level and birthplace of adults**

Characteristics of survey groups	Group A (108 households)	Group B (101 households)
Number persons in household...	362	357
Children <sup>1</sup> .....	144	125
Adults .....	218	232
Persons per household .....	3.35	3.53
	<i>Percent</i>	<i>Percent</i>
Ethnic group:		
Negro .....	82	0
Caucasian .....	6	96
Oriental .....	10	2
Unknown .....	2	2
Educational level of adults:		
Some high school .....	73	92
Some college .....	28	55
Birthplace of adults:		
California .....	14	25
Other States <sup>2</sup> .....	67	50
Other countries <sup>3</sup> .....	8	15
Unknown .....	11	10

<sup>1</sup> Under 20 years of age.

<sup>2</sup> Group A: 21 States represented, Texas, Louisiana, and Arkansas predominating. Group B: 37 States represented, none predominating.

<sup>3</sup> Group A: 7 foreign countries represented, chiefly Japan. Group B: 13 foreign countries represented, England, Canada, and the Scandinavian countries predominating.

uate public health nutrition students with prior experience in foods and dietetics. Participation in the survey was considered part of the graduate work of the public health nutrition students. All interviewers were trained in interviewing techniques.

### Survey Population

Table 3 compares groups A and B as to size, family composition, ethnic background, and birthplace and educational attainment of adults.

The mean monthly income after deductions for 99 households reporting in group A was \$350, with a range of less than \$100 to \$1,840. A comparable value for mean monthly income was not determined for group B. Of the 81 households reporting incomes in group B, 4 had incomes of \$300 or less per month, 18 had incomes between \$301 and \$500, 42 from \$501 to \$800, and 17 over \$800. Thus, the income level in group B was decidedly higher than in group A.

There was a general pattern of residential

stability in both areas. Forty-eight percent of group A adults and 62 percent of group B adults had more than 10 years' residence in the community. In both groups approximately 75 percent of the adults had resided in the State more than 10 years.

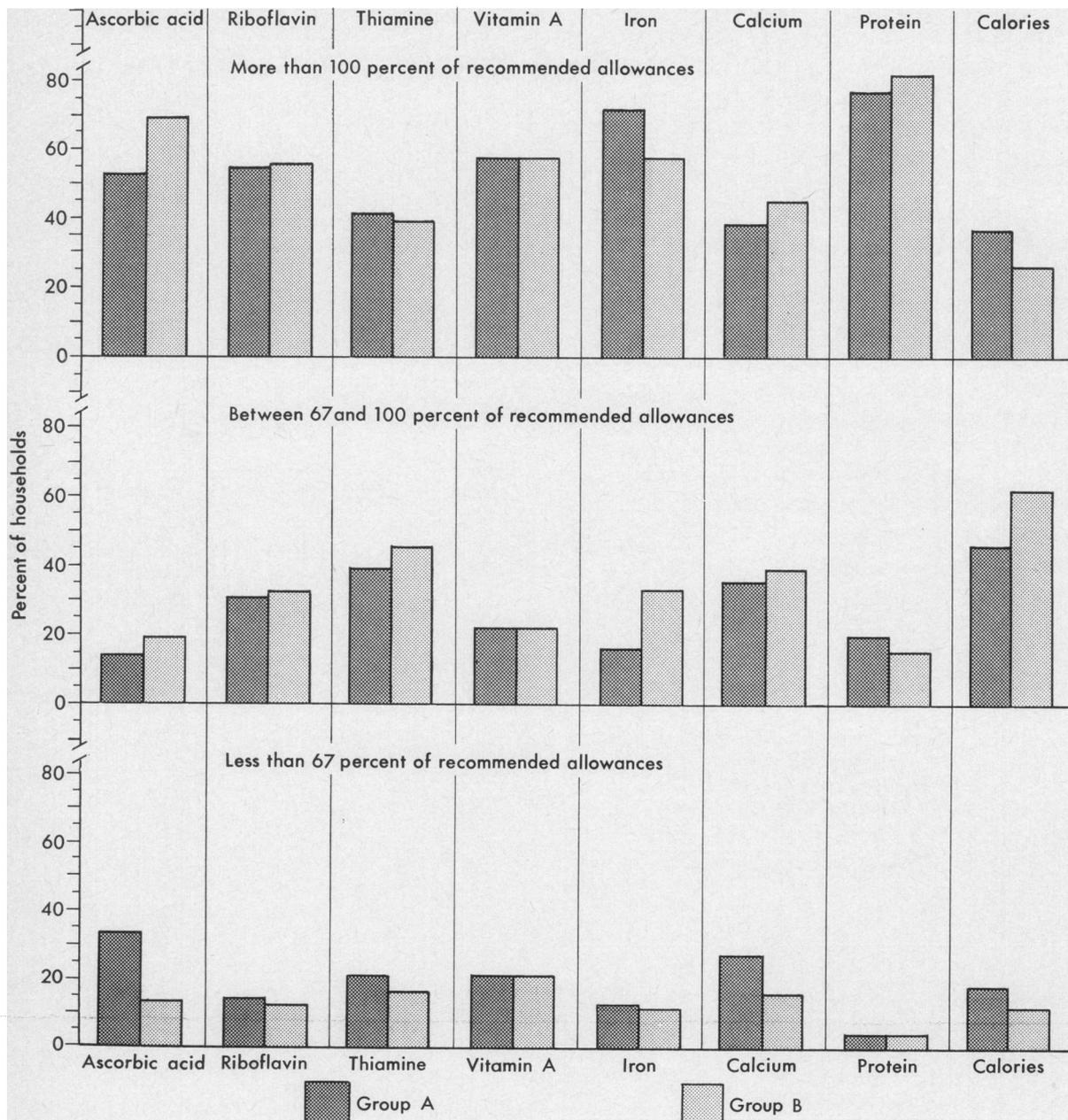
The level of employment in both areas was similar, with at least one person employed in

80 percent of group A households and 82 percent of group B households. Two or more adults were employed in 27 percent of group A and 29 percent of group B households.

### Survey Results

Food intakes for the entire household for the day prior to the day of the interview were cal-

### Dietary intakes of survey households during previous day in relation to Recommended Daily Dietary Allowances of the National Research Council



culated according to calories, protein, calcium, iron, vitamin A, thiamine, riboflavin, and ascorbic acid, using standard food composition tables (3, 4). The totals were compared with the amounts recommended by the National Research Council (5), comparisons being made for families of similar size and composition. Since the council's Recommended Daily Dietary Allowances is a generous guide for population groups, allowing for a margin of safety as high as 50 percent for some nutrients, the family intakes in this study were compared with both 100 percent and 66.7 percent of recommended amounts (see chart). The latter figure is often used in this kind of dietary evaluation.

Forty-five percent of group A families and 57 percent of group B families met or exceeded two-thirds of the Recommended Daily Dietary Allowances for the seven nutrients calculated. The nutrients that most often fell below recommendations in both groups were ascorbic acid, vitamin A, calcium, and thiamine. This follows rather closely the pattern of nutrient intake of U.S. families in the Household Food Consumption Survey in 1955 (6) in which ascorbic acid, vitamin A, and calcium were found to be the nutrients in poorest use. Similarly, more families in both the U.S. and local surveys consumed the recommended amount of protein than the recommended amount of any of the other nutrients.

Many families had more than 100 percent of recommended amounts of one or more nutrients, protein again being the favored nutrient. In 36 percent of group A and 26 percent

**Table 4. Mean nutrient and caloric intakes of survey households during previous day as percentages of Recommended Daily Dietary Allowances<sup>1</sup>**

Nutrient	Group A (percent)	Group B (percent)
Protein.....	138	133
Calcium.....	96	102
Iron.....	128	114
Vitamin A.....	145	143
Thiamine.....	98	98
Riboflavin.....	120	109
Ascorbic acid.....	127	148
Calories.....	95	90

<sup>1</sup> National Research Council.

**Table 5. Percent of survey households using various food groups<sup>1</sup> during previous day**

Food groups	Percent of households	
	Group A	Group B
Meat, poultry, fish.....	100	100
Grain products.....	100	100
Other vegetables and fruits.....	97	97
Milk.....	96	93
Sugars, sweets.....	96	88
Fats and oils.....	93	98
Eggs.....	79	84
Citrus fruit, tomatoes.....	70	91
Milk products.....	64	71
Dark green and deep yellow vegetables.....	54	61
Potatoes.....	49	65
Dry beans, peas, nuts.....	30	34
Soft drinks.....	31	10
Alcohol.....	19	18

<sup>1</sup> As designated by the U.S. Department of Agriculture (7), modified.

of group B families, calorie intakes were higher than recommended. In the opinion of many nutrition scientists the National Research Council calorie allowances are too high for the prevailing pattern of energy expenditure. Certainly there was no indication from the occupations of the adults in this survey population that calories in excess of the recommended allowances were needed. Mean intakes of calories and seven nutrients ranged from 95 percent to 145 percent of recommended allowances in group A and from 90 to 148 percent in group B (table 4).

In addition to nutrient calculations, the dietary intake data were classified into 12 food groups, alcohol, and soft drinks (table 5). For this qualitative classification a food item was included regardless of whether an ounce or a pound was reported by the family. Group B made greater use of the citrus group and potatoes, supporting the picture of a better ascorbic acid intake than group A. Use of soft drinks was reported by 31 percent of group A and 10 percent of group B households. Otherwise the use of these food groups in the two survey areas was similar, varying within a range of zero to 8 percent.

Breakfast was skipped by 8 percent of the total group A population and by 2 percent of group B; lunch was skipped by 10 percent of

group A and 3 percent of group B. In both groups the homemaker herself was the family member most likely to miss a meal. Meals were carried to school or work by 19 percent of group A and 15 percent of group B, and meals were purchased in restaurants by 10 percent of group A and 13 percent of group B.

In group A, 10 percent of the survey population, mostly homemakers, were following modified diets. The diets were primarily for weight reduction, with sodium-restricted and diabetic diets next in frequency. Eighty-three percent of the diets were prescribed by physicians and the remainder were self-imposed. One had been "prescribed" by a health food store.

In group B, 8 percent of the survey population, mainly the man of the house, were observing modified diets. Most of the diets were for weight reduction, with ulcer regimens running a close second. Seventy-nine percent had been prescribed by physicians; the remainder were self-imposed.

Vitamin supplements were being used by 39 percent of group A population and 60 percent of group B. In both groups, about half of those using supplements had prescriptions for them. In some cases in which the family diet by itself met or exceeded two-thirds of the recommended allowances for seven nutrients, all members of the household were using supplementary vitamins. This was true of 16 percent of group A and 42 percent of group B families whose diets for the day studied were of good quality.

Concern for child feeding was expressed somewhat more often by group B than group A homemakers. Such matters as pleasing children, persuading children to eat more or less of specific foods, and finicky appetites were mentioned by 13 percent of group A and 20 percent of group B respondents.

Because the range of incomes in group A was so broad, a statistical study was made of the group to determine the possible influence of income level on nutritional quality of family diets, using intakes of protein, ascorbic acid, thiamine, and calcium as criteria of nutritional quality. No correlation was found between income and nutrient intake for any of these nutrients. Neither was there any correlation found between intake of these nutrients and

the amount of money families reported spending for food.

Following are the answers to several survey questions relating to the complex matter of what families actually eat and why, their sources of nutrition information, and their feeding problems. The questions were open ended. Many respondents gave multiple answers.

	Group A (percent)	Group B (percent)
<i>How do you decide what to have for the family to eat?</i>		
What the family likes and/or what looks good in the market.....	66	53
Cost factors.....	28	23
Health factors.....	23	16
Time factors.....	6	8
<i>If you had more money for food, what would you buy that you are not already buying?</i>		
No difference.....	43	50
More and/or better meat.....	31	44
Fruit and vegetables.....	19	4
Dairy products.....	7	3
<i>If you had less money for food what changes would you make?</i>		
Less and/or cheaper meat; more meat substitutes.....	52	49
Could not cut down.....	19	12
Less beer, soft drinks, desserts, coffee.....	17	14
More cereals and potatoes.....	5	14
Less fruit and vegetables.....	4	5
Stricter budgeting; more careful buying.....	0	16
<i>If you ever have any questions about nutrition, where do you turn?</i>		
Doctor.....	43	31
Books, newspapers.....	42	32
No questions.....	24	21
Miscellaneous persons.....	11	30
<i>What do you (the homemaker) consider the hardest part of feeding your family?</i>		
No "hard part".....	36	30
Pleasing the family.....	26	24
Menu planning.....	20	14
Cost.....	9	2
Management of time.....	7	7

## Discussion

The most striking and unexpected finding of the survey was the similarity in food practices, in factors that influence food practices, and in perceptions of nutrition problems in the two survey groups. Selection of the areas to be sur-

veyed had been made on the basis of their contrasting ethnic, social, and economic characteristics. It was anticipated that these differences would be reflected in eating practices and interest, but this proved not to be the case. It appears that the "melting pot" of the city continues to function, creating a homogeneous and conforming population with respect to eating patterns as with many other cultural expressions.

Although there were more families in one area than in the other who had a diet that met two-thirds of the recommended dietary allowances for the seven nutrients studied, the overall picture of nutrient intake and of the use of various food groups was similar in the two areas. The nutrients in good use and those that were most often neglected in family diets were the same for both groups with the exception of ascorbic acid, which was considerably lower in one group than in the other. Likewise, in both areas the most important single factor that seemed to determine which foods appear on the family dinner table was food preference of various family members with cost of food a lesser consideration. It was evident also that food likes and dislikes far outweighed health considerations.

It is of interest to compare the dietary intake data (chart and table 5) with responses to the question, "If you had more money for food, what would you buy that you are not already buying?" The chart shows that all but 4 percent of families had a protein intake that met or exceeded 66.7 percent of the recommended allowance and that the vast majority of the two groups had more than 100 percent of the recommended allowance for protein. About 10 percent of households failed to meet recommendations for iron, but a larger number (27 percent and 16 percent) were low in calcium, indicating that more of the protein came from meat than from dairy products. Table 5 tends to bear out this general pattern. However, when asked what they would buy if they had more money, 31 percent of group A and 44 percent of group B said they would buy more or better meat. From a nutritional point of view they were already buying more than enough. On the other hand, although intakes of vitamin A and ascorbic acid were low in many family diets, only

19 percent of group A and 4 percent of group B mentioned buying more fruits and vegetables, important sources of both these nutrients.

The relative importance of food preferences as compared with health factors in influencing food selection has received considerable attention in the literature. Two references seem particularly pertinent. First, during World War II, Margaret Mead (8), discussing social and psychological characteristics of U.S. food patterns relative to planning the nation's wartime food program, referred to two specific traditions: the Puritan dichotomy of food that is liked and food that is healthful (the eating of food that is disliked but healthful is rewarded with food that is liked) and the attitude prevalent in southeastern United States which places emphasis on the taste and enjoyment of the food rather than on health.

More recently, the Agricultural Marketing Service of the U.S. Department of Agriculture (9) studied the effects of a campaign to promote the sale of apples. They reported an increase of 32 percent in apple sales when use of the fruit was emphasized, as compared with a 21 percent increase in sales when healthfulness of the fruit was the theme. Thus, this tendency of the general population to subordinate health to other considerations when selecting food persists even after the intensive wartime nutrition education programs which stressed the food-health relationship. It is a particularly noteworthy factor in this survey population with its atypically high educational level (table 2).

It was surprising to these investigators that homemakers did not express greater concern about the cost of food than was evident from our findings. It had been anticipated that residents of the lower income area would point out cost as a greater problem than those in the higher income area. As previously noted, this was not rated as a top priority problem nor was there much difference in responses to this item between the two survey areas. Similarly, the nutritional quality of the family's food proved to be independent of family income or expenditure for food. We suggest that the general economic level of these householders was sufficiently above subsistence to enable even those in the lower brackets to procure a satisfactory diet. Given an income high enough for an ade-

quate diet, there is not necessarily any nutritional advantage to be gained by an even higher income.

Also, there appeared to be a contradiction in the responses pertaining to cost of food: cost ranked a low second among factors that influence food selection, yet cost rated considerably lower as a problem in family feeding. We suggest that food cost was not listed as a major problem because the homemaker has adapted her food selection to a level reasonably compatible with the family budget. This "standard of living" may serve as a guide as Mrs. Homemaker buys groceries, perhaps directing her to choose ground beef instead of steak and an economical canned vegetable or no vegetable at all rather than an out-of-season fresh vegetable. Thus the cost of food is an ever-present concern that may be handled satisfactorily and so is not regarded as a major problem. Yet, when confronted with the hypothetical situation of having more money for food, perhaps the homemaker would choose steak rather than ground beef and would buy more fruits and vegetables. This is what she said she would do.

### Applying the Results

Some of the findings have already found relatively simple application. Others having implications for long-range program planning are being put to work gradually. A few examples may be cited:

All health department staff whose work relates in any way to the imparting of nutrition information have been apprised of the survey results. The nutrients which were found to be neglected most often and the food groups which are the best sources of these nutrients continue to be emphasized in staff nutrition conferences and in all appropriate community nutrition education activities.

Progress has also been made in modifying a pattern which is widespread among health workers, the tendency to stress the economy features of certain foods when working with families who, we think, should welcome suggestions for saving money. Since completion of the survey, measures have been taken to encourage another approach, emphasizing the taste appeal

of foods, their acceptability, ease of preparation, convenience, and so forth, rather than low cost. The cost factor is not, of course, overlooked. There is just less talking about it by professional staff.

One survey finding was that the preferred source of information about nutrition is the physician. There are many ways in which a public health nutrition program can help provide the physician and his patients with practical and accurate information about food and nutrition, whether it be normal or therapeutic diet. Many physicians are too pressed for time to discuss diet with the patient in sufficient detail. Others may not have enough specialized experience in nutrition to do so. Various means of improving this important channel of nutrition teaching are being explored, including group classes for instructing patients in modified diets and a dietary consultation service to which physicians may refer patients.

There are several implications for educational programs in the finding that food preferences rank high and health concerns rank low as influences on the family's food selection. Pilgrim (10) states that experiences in the early years of life, prior to age 16, are among the strongest controlling factors in food preferences. Encouraging familiarity with a variety of foods at an early age, under pleasant circumstances, has long been a dictum in child feeding, one that should not—but often does—stop as the child leaves the preschool years. The school lunch program and the classroom are ideal places for expanding the child's knowledge of and pleasurable experiences with good food and thus serve in a complementary capacity to the home. The school years can be a vital period for establishing food preferences suited to good nutrition and also for teaching the relationship between eating practices and health. It is a minor issue which theme predominates—"I eat it because it's good for me" or "I eat it because I like it." One motivation is not necessarily superior to the other. Our concern is with the result—good food selection.

There is clear need for strengthening health curriculums in the schools and for setting in operation a long-term plan for including nutrition information in the school program. Ideally such a plan would be designed to in-

fluence food habits and might either augment or replace the usual 1- or 2-week unit concerned with teaching nutrition facts only. A close working relationship between the public health nutrition program and the health curriculum committee in the schools can help in promoting better food selection among school-age children and in the entire community. Such a relationship is being pursued.

These are a few illustrations of the way in which various phases of the on-going nutrition program are profitably using information from the survey—information which would otherwise not have been available.

### Summary

A dietary survey for program planning purposes was conducted in Berkeley, Calif., to obtain information about dietary intakes and other food practices and interests of families. Interviews were carried on with 209 families, approximately equally divided between two areas of contrasting ethnic and socioeconomic character. Family food intakes for the day prior to the date of interview were calculated for calories and seven nutrients and compared with 100 percent and 66.7 percent of the National Research Council's Recommended Daily Dietary Allowances.

The pattern of dietary intake indicated need for improvement. Only 45 percent of one group and 57 percent of the other group of families met or exceeded two-thirds of the recommended allowances for all nutrients calculated. The nutrients that fell below two-thirds of recommended amounts for more than 12 percent of the families in both groups were vitamins A and C, calcium, and thiamine. The ascorbic acid intakes of one-third of the families in one group were below two-thirds of recommended amounts. The nutrient in most generous use was protein.

Striking similarities were found in the two groups in most of the aspects of food practices and interests that were studied despite the sharply differing populations represented. This suggests the possibility that urban life tends to favor homogeneity in eating practices as well as in other aspects of the culture.

Food preferences outranked cost factors 2 to

1, and outranked health factors  $2\frac{1}{2}$  to 1 as determinants of what appears on the family's dinner table. Protein intakes were more than adequate in a majority of the households and vitamins A and C were low in many diets. Yet when asked what they would buy if they had more money for food, approximately one-third of the respondents said "more and better meat" and only about one-tenth answered "fruits and vegetables."

Respondents considered the physician the primary source of nutrition information. About 10 percent of the survey population were following modified diets, of which about 80 percent were prescribed by a physician. Thirty-nine percent of one group and 60 percent of the other were taking vitamin supplements, half by prescription, half by self-direction. Many nutritionally good diets were being supplemented with vitamins.

Information gathered from the survey is finding practical application both for immediate use and for long-term program planning.

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## Lloyd and Atkins Appointments



**Dr. Ralph S. Lloyd**, former director of the Dental Department, Clinical Center, National Institutes of Health, became chief dental officer of the Public Health Service on January 1, 1962. He succeeds Dr. John W. Knutson, who retired in October 1961.

Dr. Lloyd entered the Public Health Service as a dental intern at the Marine Hospital, Baltimore, in 1932 and was commissioned in the Regular Corps in 1934. His stations have included the Outpatient Clinic, Washington, D.C., and Public Health Service hospitals in Savannah and Baltimore.

During World War II, Dr. Lloyd was 1 of 77 Public Health Service dental officers assigned to sea duty. While dental officer on the U.S.S. *Calloway*, an attack transport, he saw action in the invasions of Kwajalein in the Marshall Islands, Kavieng in the Emirau Islands, and Saipan in the Marianas group. His ship received the Navy Unit Commendation.

While stationed in Baltimore, Dr. Lloyd participated in and directed a number of clinical research projects. Among them were the initial studies on the use of xylocaine for dental anesthesia in this country and some of the early studies on the use of water spray to minimize heat production during high-speed instrumentation.

Dr. Lloyd is a member of the American Prosthodontics Society, the American Society of Cleft-Palate Rehabilitation, the American Dental Association, the American Association for the Advancement of Science, and the American Academy of Maxillo-Facial Prosthesis, and is a fellow of the American College of Dentists.

He is a graduate of Mt. Union College and Western Reserve University School of Dentistry, and has done

graduate work in maxillo-facial prosthesis at Memorial Hospital in New York City.

**Callis H. Atkins** assumed his duties as chief sanitary engineering officer of the Public Health Service on January 2, 1962, following the retirement of Mark D. Hollis, the former chief.



Mr. Atkins reported for active duty in the commissioned corps in March 1942, and has served since 1955 as associate regional health director for environmental health services, in charge of sanitary engineering activities of the Public Health Service in Maryland, Virginia, North Carolina, West Virginia, Kentucky, the District of Columbia, the Virgin Islands, and Puerto Rico.

From 1952 to 1955 he was assigned to the U.S. Technical Cooperation Mission to India as an adviser in public health engineering to the Indian Government. Prior to that he held various assignments in the Service including assistant to chief engineer and regional engineer in Kansas City, Mo., for North Dakota, South Dakota, Nebraska, Minnesota, Missouri, Kansas, Oklahoma, Iowa, and Arkansas.

Mr. Atkins is a charter member of the Inter-American Society of Sanitary Engineers, and a member of the American Public Health Association, the American Water Works Association, the Conference of State Sanitary Engineers, and the Conference of Federal Sanitary Engineers. He is a diplomate in the Academy of Sanitary Engineers, fellow in American Society of Civil Engineers, and a registered professional engineer in the District of Columbia and Virginia.

He is a graduate of the University of North Carolina, and has done graduate work in engineering at both the University of North Carolina and Harvard.